THE QUARTERLY BULLETIN

— OF THE —

STATE PLANT BOARD

OF MISSISSIPPI

VOL. 2 OCTOBER, 1922 NO. 3

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A. & M. COLLEGE, MISSISSIPPI

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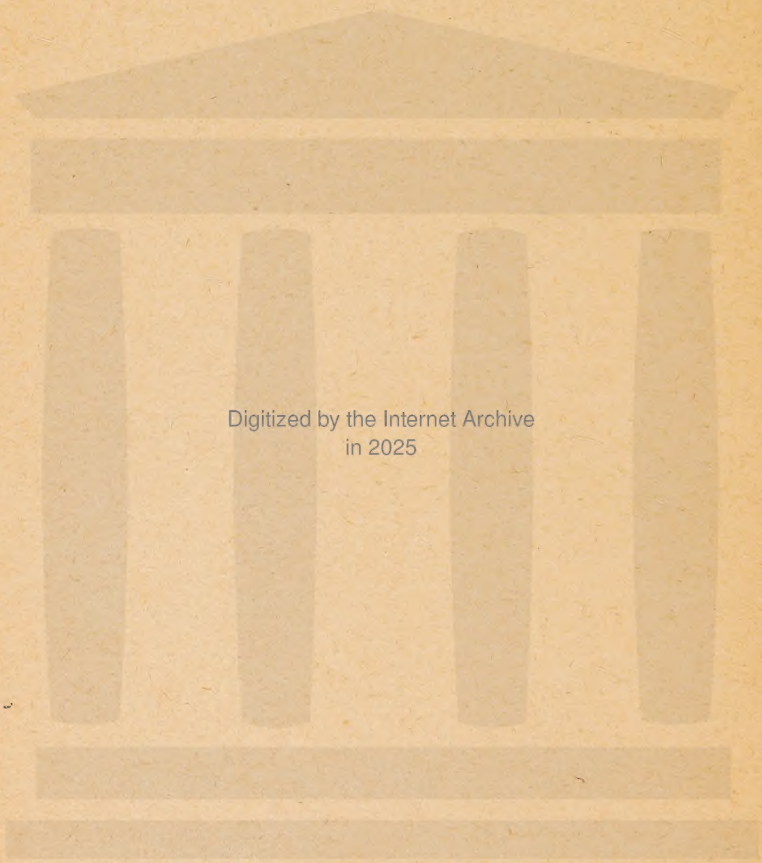

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A. & M. COLLEGE, MISSISSIPPI

Entered as second-class matter July 9, 1921, at the post office at A. & M. College, Mississippi, under the Act of June 6, 1900.

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A. & M. College, Mississippi

The Status of Sweet Potato Weevil Eradication in Mississippi

K. L. Cockerham

Three years ago the Bureau of Entomology and the Mississippi State Plant Board took up co-operatively the task of sweet potato weevil eradication in Mississippi. The plan of the work was for the Bureau to furnish the men to do the field work and the State Plant Board was to furnish material and equipment such as seed potatoes, planting stock, *et cetera.*

The first thing necessary was a survey of the situation to determine just how extensive the infestation was. This was done by making a house-to-house inspection in South Mississippi by Bureau men while State Plant Board men were watching out for weevil in other parts of the State while engaged in their regular routine inspection and scouting. The result of this survey showed only Jackson, Harrison, Hancock, and the lower portion of Pearl River counties infested. The plan that was then put into effect was to sign contracts with the owners of infested farms, whereby they agreed to dispose of any planting material on hand, hog off fields, clean up the premises and rotate their crops. They were also to give such co-operation as might be deemed advisable. In consideration of these things, and in order not to work a hardship on some of the farmers who could not well afford to purchase weevil-free plants, the Plant Board agreed to furnish free of charge all the draws or plants necessary for an ordinary crop. No seed potatoes were permitted to be bedded on any of the infested farms.

The plan that has just been outlined was put into effect in 1920 and has been followed closely for the past three seasons. Needless to say our work has met with some opposition; but on the whole we have secured very good co-operation.

During the late summer and fall field and vine inspections are made, first to determine the per cent of injury on infested farms, and second, to locate any new infestations which might occur. In the late fall and winter contracts for plants for the following spring are signed. In the early spring old storage banks and houses are cleaned out and the old rotten potatoes and rubbish are burned. During the planting season plants are grown and delivered to these infested farms. Each spring the State Plant Board beds down 1,000 to 1,300 bushels of seed potatoes to insure plenty of weevil-free plants; these are grown in Stone county.

It has not been possible to conduct this work without finding new infestations occasionally. These have been confined however to the same infested localities. The neighborly and hospitable spirit which prevails in the South has caused us quite a bit of worry; it has been impossible to prevent the giving away of eating potatoes, plants, and seed potatoes. While this is going on it is almost certain to facilitate the distribution of weevils from one farm to another. But we have been extremely gratified that the infestation has not spread into new territory. The efficient quarantine of the Plant Board has stopped shipments of seed potatoes and plants. At the present writing the infestation in Pearl River county has been reduced approximately 40%; in Hancock 60%; in Harrison 50%; and in Jackson the number of individual infestations has not been reduced. But an important item not to be overlooked is the fact that on these farms that are still listed as infested the injury is much less than it formerly was. Any figures which might be published would not in reality show just how much the damage by this pest has been abated. An idea of how the work has been accepted may be had from the following testimonials:

From a prominent citizen of Hancock county: "Before this work was started I used to see entire crops that were ruined by the weevils; you don't hear of anything like that now."

From a plant grower of Stone county: "Keep up the work on the coast for we don't want the weevil up here. It will absolutely ruin our business."

From citizens of George county: "Whatever you do, don't let the weevil get up here. Keep up the fight until it is eradicated."

With the harvest of this fall's crop it seems evident that still better results will be seen than at this writing. Every indication points to a very greatly reduced infestation in each of the four infested counties.

THE SUGAR CANE MOTH BORER IN SOUTH MISSISSIPPI*

By T. E. Holloway

Entomologist, Southern Field Crop Insect Investigations, U. S. Bureau of Entomology.

Farmers in southern Mississippi have recently begun to notice "worms" in the stalks of sugar cane. These are usually seen when the cane is cut for eating, as on such occasions it is more carefully examined than when it is to be planted or ground. The worms are found to bore holes or tunnels through the stalks, making the cane almost worthless where the infestation is very heavy.

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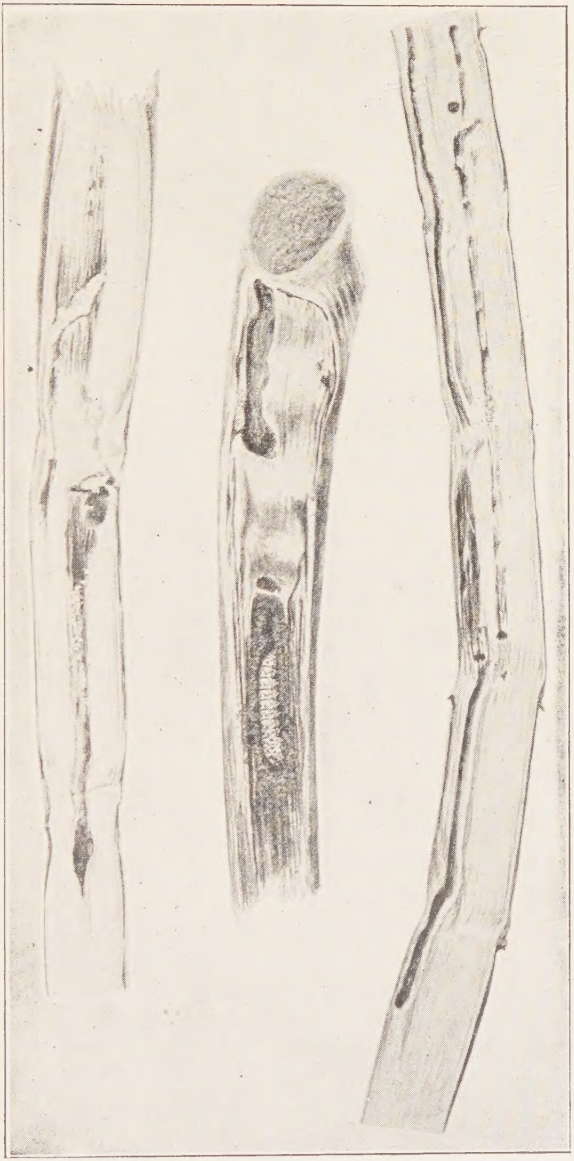

Fig. 1. Sugar Cane Moth Borer Tunnels—Larva in Middle Stalk.

A Pest in Many Countries

This worm is the sugar cane moth borer, *Diatraea saccharalis crambidoides*, one of the chief sugar cane pests of the world. In the United States its principal damage is in Louisiana, owing to the large acreage of cane in that state, but it also occurs in Florida, Texas, and to a limited extent in Mississippi. An infestation around Woodville in Wilkinson County, north of Baton Rouge, has been known for some years. More recently, the moth borer has been found along the Mississippi Coast, from the Louisiana border to Biloxi, and extending inland from a few miles at Biloxi to about twelve miles (above Logtown) on the Louisiana line.

Damage to Sugar Cane and Corn

The first damage in the spring is in killing the young plants of sugar cane. Moths emerge from the planted cane stalks and cane debris left about the fields and fly to the young plants, depositing masses of eggs on their leaves. Small worms or larvæ hatch from these eggs, feed a little on the leaves, and then make their way down to about the surface of the ground or a little below and gnaw into the young stalks. The effect on the cane is that the inner part of the plant is killed, while the outer part retains life for a considerable time. The result is that plants can be found with the central shoot dead and dry and the outer leaves still green. While various causes may account for this condition, it is often due to the sugar cane borer, and when caused by the borer a hole can be found in the plant near the surface of the ground with the worm inside the plant.

The large stalks are not killed by the moth borer. Even when there is considerable damage the general appearance of the cane will be unchanged. Only a close examination will show numerous holes through the rind, sawdust-like excrement between the leaves and the stalks, and crooked tunnels within the stalks.

An ordinary infestation of the moth borer causes a loss of from one-sixth to one-third of the crop.

The borer takes readily to corn, which in fact it prefers to cane, and inflicts similar injury. It is especially injurious to late corn. It can breed in large grasses, such as Johnson grass, but it is not usually numerous in such plants. It does much damage to broom corn and to various forage crops such as sorghum, kaffir corn, etc.

The Life of the Sugar Cane Moth Borer

The larva or "worm" is about an inch in length when full grown. When at its maximum size the larva sheds its skin and becomes a pupa or "cocoon," a brown, legless object which does not feed and is incapable of motion except that it thrashes about with its "tail" or

Fig. 2. "Dead Heart" Caused By Sugar Cane Moth Borer.

abdomen when disturbed. In about a week the skin of the pupa bursts open and a straw-colored moth works its way out. Being in a cane or corn stalk, it has to force itself through a hole in the side of the stalk which the larva has previously gnawed for the purpose. After mating, the female moths fly to the leaves of their host plants at night and deposit masses of flat eggs on the leaves. These eggs hatch, small larvæ emerge from them, and after a little preliminary gnawing of the leaves they too make their way into the stalks, spending all the rest of their lives in this protected situation up to the time they become moths.

There are four or five broods or generations of the moth borer during the year. Though there are usually few borers in the spring, the rapid multiplication during the summer brings about a high infestation of the stalks when the cane is ready to grind in the fall. Even long before fall the corn on the sugar plantations is heavily infested, and the stalks becoming dry the moths emerge and fly to the adjoining fields of cane, thus increasing the infestation there.

The pest passes the winter in the worm stage in stalks of planted sugar cane, in scraps of cane left after grinding, in the stems of large grasses, etc. The larvæ become moths in the spring, and can emerge not only from the cane left lying on the ground but also from planted stalks. The moths are able to work their way even through packed soil.

Control of the Sugar Cane Moth Borer in Mississippi

On the large sugar plantations the moth borer is very difficult to control, but conditions in Mississippi are so different that it is likely that control would be comparatively simple.

There are no large plantings of cane as in Louisiana, where thou sands of acres are grown. A field of two acres is regarded in southern Mississippi as rather large, and perhaps the average planting is less rather than more than half an acre. This makes it possible for the owner to give the cane such care and attention as would be out of the question on a typical sugar plantation, especially as the infestation in Mississippi has apparently not reached a high percentage of the stalks.

The writer suggests the following control measures:

1.—Plant only cane perfectly free of borers.

2.—Destroy all scraps of cane left after the cutting and grinding.

3.—In the spring go through the fields and cut out the young plants killed by the borers. Destroy all borers found.

4.—Be careful not to ship infested seed cane. To do so may spread the infestation.

APPLE BLOTCH AND ITS CONTROL

By D. C. Neal, Plant Pathologist

Numerous complaints have been received during the past two seasons from home orchardists, as well as commercial growers, as to the prevalence and destructiveness of apple blotch. This disease of apples has been especially prevalent in many of the northern counties of Mississippi the past year. Blotch constitutes one of the most important diseases of apples in the southern portion of the Mississippi Valley, and many authorities state that it is perhaps more serious and as difficult to control as bitter rot or scab, two other important diseases of this fruit.

Origin of the Disease

Among pomaceous fruits blotch is known to occur only on the apple. The native species of crab apple are also subject to the disease but it is still an open question as to whether blotch originated on the wild species, and was transferred to the improved species of apple, or whether it came from some other native host. As early as 1895, however, it was found on leaves of wild crab and on apple fruit.

Economic Importance

Apple blotch is now uniformly present from year to year in the Mississippi Valley states and those of the South and Southwest, and because of its less sporadic nature as compared to other apple diseases, the amount of loss caused by this trouble is sometimes enormous. In such states as Arkansas, Kansas, and the southern portions of Missouri, Illinois, Indiana, Kentucky, and Tennessee, frequently from 25% to 80% of the apple crop is commonly affected. In Benton county, Arkansas, the loss to apple growers from blotch on the fruit in 1907 amounted to $950,000, while in Clay county, Illinois, the loss annually from blotch is placed at $50,000. This disease has been reported from some twelve or fifteen counties in Mississippi, and the fact that it appears to be increasing not only in the northern counties of the State, but in other widely scattered sections, it is well that growers and home orchardists should inform themselves as to its presence as soon as possible.

Symptoms of Blotch

Blotch is found on the fruit (Fig. 3) twigs, and leaves. It is also evident on the older limbs (Fig. 4b) in the form of roughened bands on the bark. It causes the most serious damage on fruit but on varieties especially susceptible to its attack, it may cause the death of fruit spurs or even small branches and thus materially reduce the yield of fruit. Ordinarily the damage to the leaf is not

serious since the spots are always very small and do not cause defoliation. On the fruit the disease appears as blotches or spots from 5-20 mm. in diameter, dark in color, with an advancing margin of peculiar, irregular, jagged, or fringed appearance. The lesions frequently have a stellate (star-like) appearance, which is due to the strands of hyphae radiating from the central area. By coalescence large spots may form, and owing to tension, cracks appear, enlarging to a centimeter in length, or even girdling the fruit and reaching to to the core. In the older portions of the blotched areas, minute

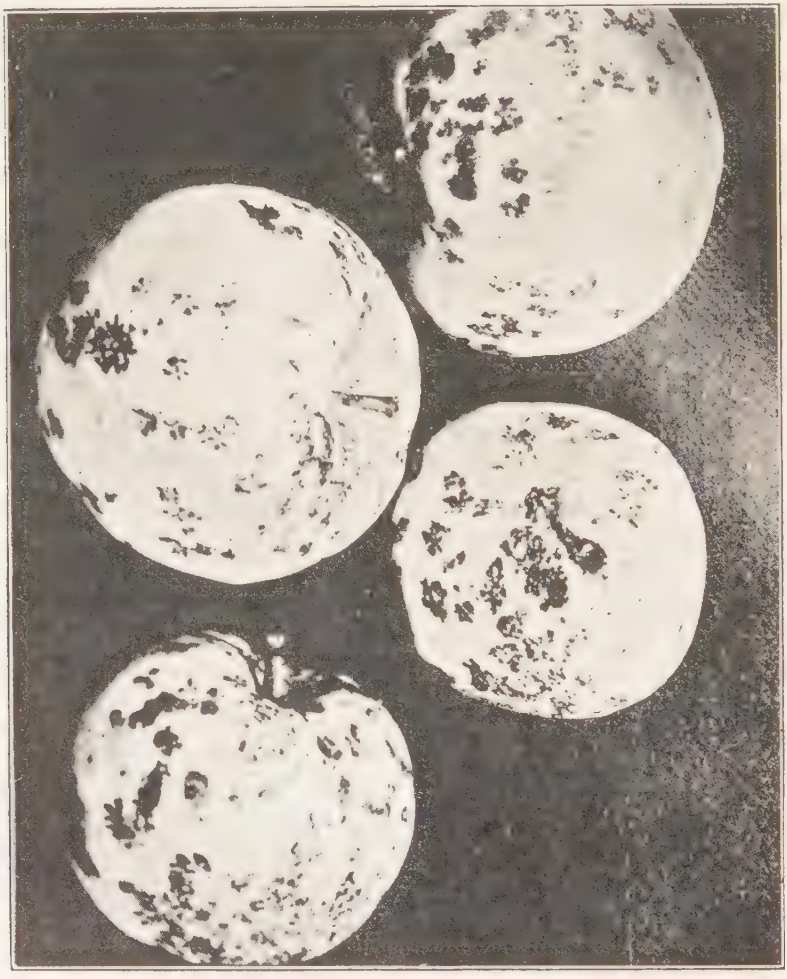

Fig. 3.—Apple Blotch as it occurs on the fruit. (After Duggar)

pycnidia (fruiting bodies) appear. Blotch mars the appearance of the fruit and injures it as a salable product.

On twigs, superficial cankers are produced. These are especially evident on fruit spurs (Fig. 4 a, c,), and water sprouts (Fig. 4 d). If the disease is present in an orchard, it is most surely and quickly found by examining any water sprouts that may be present. The cankers are not evident from infections of the current year, except upon close examination late in the season, when they appear as small, olive-brown spots. The following season, however, the spots on the

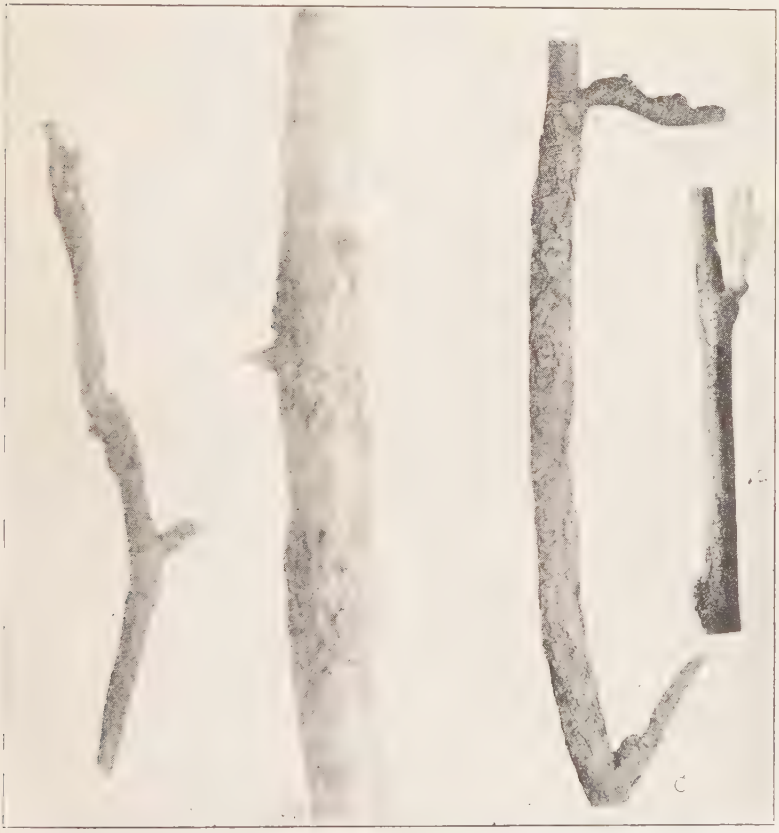

Fig. 4.—Blotch: (a) On Fruit Spurs; (b) Old Cankers on Limbs; (c) On Young Branches, Showing Roughened Bark; (d) On Water Sprout, Showing Pycnidia of the Fungus on One-and-Two-Year-Old Lesions. (After Anderson, H. W., Ill. Circular No. 241.)

twigs are sharply defined. The central area is slightly raised, light tan in color, with pimples (pycnidia) scattered over the surface. Surrounding this is the reddish-brown area of the current season's development. Upon older limbs and twigs the cankered bark becomes roughened, with cracked-like bands or furrowed areas which are quite characteristic.

Cause of Blotch

Blotch is caused by a fungus, known as *Phyllosticta solitaria*. This fungus winters in the mycelial state in cankers on twigs and on fruit spurs. In the spring, pycnidia or fruiting bodies are matured beneath the surface of the bark, and these produce spores in great numbers, which are discharged during damp weather, and are carried by water, wind, and insects to the fruit, leaves and twigs where infection takes place.

Susceptible and Immune Varieties of Apples to Blotch

The Ben Davis, Missouri Pippin, Mammoth Black Twig, Limber Twig, and Maiden Blush are highly susceptible to blotch, while Jonathan, Winesap and York Imperial are almost immune.

Control of Blotch

For control of blotch, consistent and judicious spraying is necessary. Usually three applications of 3-4-50 Bordeaux mixture or applications of lime sulfur (summer strength) are necessary to control the disease. The first spraying should be made about three weeks after the petals fall. This is the most effective blotch spray as it is applied just before the majority of spores are expected to be discharged. The second application should be given about two weeks after the first and the third about two weeks thereafter. During seasons of wet weather, lime sulfur may be substituted for Bordeaux in order to avoid foliage burning. Continuous care of the orchard from year to year as to matters of pruning and the removal of water sprouts and surplus branches will also aid the necessary spraying program by reducing the number of hibernating places of the fungus. Trees sprayed carefully from year to year are usually free of cankered limbs.

SOOTY BLOTCH AND FLYSPECK OF THE APPLE

By D. C. Neal, Plant Pathologist

In poorly pruned orchards located on low ground, a cloudy or smoky appearance is produced on the fruit during damp seasons which may result in materially reducing its market value. This disease, also sometimes called "sooty smudge" or cloud, but perhaps

Fig. 5.—Sooty Blotch and Flyspeck on Apples from North Mississippi.
Flyspeck at Left, Sooty Blotch at Right.

more commonly known as "sooty blotch," is present on both apples and pears in many orchards in Mississippi late in the season. (Fig. 5, right.)

Accompanying sooty blotch there is also usually a disease evidenced by minute black dots covering the surface of the fruit. These black dots form in clusters and resemble to a remarkable extent ordinary flyspeck. (Fig. 5, left.) This fungus does not cause extensive damage, as the growth is entirely superficial, but the market value of the fruit is lowered, particularly in the case of the green or yellow varieties. Flyspeck, like sooty blotch, appears late in the season during wet, cloudy weather, and especially where the orchard is located on low poorly drained soil.

Cause of Sooty Blotch and Flyspeck

Sooty blotch and flyspeck were for a long time thought to be caused by the same fungus but more recent investigations indicate that they are caused by separate and distinct organisms. Sooty blotch is caused by a fungus known as *Gloedes pomigena*, whereas flyspeck is attributed to the fungus, *Leptothyrium pomi*.

Little is known concerning the time and manner of infection of both of these diseases, but the relatively late appearance of the diseases on the fruit would indicate a late-spring or summer infection.

Control

In orchards where these diseases are causing serious injury to the fruit it is advisable, in addition to the regular spray schedule, to apply one or two sprays during July and August. Either the 3-4-50 Bordeaux mixture, or Atomic Sulphur, 1 pound to 8 gallons of water, may be used. Careful and consistent pruning to open up the trees is also effective in controlling sooty blotch and flyspeck. Poorly drained soils and humid localities should also be avoided when selecting the orchard site.

MEXICAN BEAN BEETLE EXTENDS TERRITORY

Scouting reports from the Federal Bureau of Entomology show that the Mexican Bean Beetle has continued its general spread this summer in a northeasterly direction, which was the prevailing trend of the pest last year. Due to lack of funds, a comparatively small amount of scouting has been done by the Bureau and it is impossible to accurately estimate the new territory infested this season. Substantial gains to the north and east have been recorded, however, in all the infested states. No new state has reported an infestation, so it is possible that the pest has not yet crossed the borders of any

Fig. 6.—Pole Lima Beans totally destroyed by Mexican Bean Beetle, Chattanooga, Tenn. (Bureau of Entomology.)

Fig. 7.—Bean Plant destroyed by Mexican Bean Beetle.
(Bureau of Entomology.)

Fig. 8.—Knapsack type of bellows duster in use against Mexican Bean Beetle. (Bureau of Entomology.)

states except Alabama, Tennessee, Georgia, Kentucky, North Carolina and South Carolina.

It is fortunate indeed for the people of Mississippi that the beetle has no particular inclination to wander westward, for since last summer it has been within a few miles of the line, and reports of its appearance in Mississippi have been expected all this year. People living in the eastern parts of Tishomingo, Itawamba, Monroe, and Lowndes Counties should watch their gardens for the first appearance of the beetles and be ready to use control measures against them. With its decided preference for moving north and east, and barring the chance of accidental importation in hay, beans, or other farm products, it may be several years before serious injury from the pest will become state-wide.

However, this tarrying along the eastern border may be considered only as a reprieve from the serious blow to the bean crop which is sure to come, as shown in the accompanying photographs furnished by Neale F. Howard, of the Bureau of Entomology. Already the Bureau is advising growers to discontinue planting pole beans in sections where the beetles are very abundant, and the control measures necessary to protect bush beans have materially reduced the profits of commercial growers. The U. S. Department of Agriculture has estimated that the annual loss will reach $100,000,000.

The Bureau has been doing a great deal of experimental control work and one of the most effective measures developed is a dusting mixture of 1 part high grade tri-calcium arsenate and 9 parts hydrated lime, applied to the under surfaces of the leaves, from one to four applications being necessary. Magnesium arsenate, used as a spray at the rate of 1 pound to 50 gallons of water, has also been effective without injuring bean foliage. Most other arsenicals, including Paris green, lead arsenate, and zinc arsenite, are not advised for beans in the Southeastern States.

THE ARGENTINE ANT SITUATION

Two or three years ago when efforts were made to get certain towns interested in putting on Argentine ant control campaigns, a great many people—perhaps most of the people—in the infested towns doubted if the ants really could be controlled. Practically all of these people are now thoroughly convinced that an Argentine ant control campaign is worth many times what it costs any community. In 1920, the Plant Board assisted four towns in putting on ant control campaigns. In 1921, seven towns were given this assistance. Already this fall, fifteen or twenty towns and cities have begun preparations to put on campaigns to control the ants.

The towns and cities that have so far this fall either put on Ar-

gentine ant control campaigns or have made definite arrangements to do so, are as follows: Aberdeen, Meridian, Laurel, Hattiesburg, Ellisville, Gulfport, Summit, Woodville, Hazlehurst, Greenwood, Durant, Columbus, Starkville, Greenville, Biloxi, Jackson, and Fayette.

The total number of infested places in the state is steadily increasing in number. At present there are about sixty-five towns and cities that are known to be infested. The infestations that have recently been discovered are as follows: Morton, Fayette, Sturgis, Goodman, McAdams, Prentiss and Centerville.

M. R. Smith, Ant Specialist for the Plant Board, has been making surveys of infested towns as rapidly as possible. A few surveys have been made by other Plant Board workers. By the end of the year, the Argentine ant infestation in almost every infested town will be mapped, so that by referring to our maps we can tell almost exactly what the situation is in any infested town. These maps will be revised each year.

LIST OF MISSISSIPPI NURSERIES—SEASON 1922-1923

Name of Nursery—	Address—	Kind of Stock—
Aberdeen Floral Company, Mrs. J. R. Young, Proprietor	Aberdeen	Ornamental
J. B. Adams and Son	Pass Christian	General
J. B. Allen	Biloxi	Strawberry
R. L. Atkinson	Madison Station	Strawberry
A. C. Ball	Mantee	General
Eugene Barrett	Lauderdale	Strawberry
Bass Pecan Company, I. E. Bass and Sons, Proprietors	Lumberton and Ocean Springs	General
Bay View Nursery, C. Forkert, Proprietor	Ocean Springs	General
J. W. Beacham	McComb	Peach
A. M. Beall	Gum Pond	Pear
Bechtel Pecan Nurseries, Theo. Bechtel, Proprietor	Ocean Springs	General
V. J. Bell	Eupora, R. No. 3	General
Mrs. Edith Biddle, Florist	Greenwood	Ornamental
D. C. M. Bigham	Pontotoc	General
Biloxi Nursery, James Brodie, Proprietor	Biloxi	General
W. L. Blackledge	Saucier	Citrus and Pecan
Bolen Nursery and Orchard Company, E. E. Bolen, Proprietor	Lucedale	General
W. H. Bouslog	Gulfport and Kreole	General
C. E. Brown	Hattiesburg	Pear
Brown's Vineyard, A. C. Brown, Proprietor	Waveland	Grape

Name of Nursery—	Address—	Kind of Stock—
Bruce Nursery Company, R. W. Bruce, Proprietor	Hermanville	General
Burkett Nursery Company, W. L. Burkett, Proprietor	Columbia	Pecan
California Orange and Pecan Company, A. B. Cox, Proprietor	Helena	Citrus and Pecan
V. Campbell	Wiggins	General
Rosa Carley, Florist	Columbia	Ornamental
Carter Nursery Company, S. P. Carter, Proprietor	Hattiesburg	General
I. P. Carver	Ocean Springs	Pecan
J. H. Chapman and Sons	Batesville	Strawberry
George Chevalier	Gulfport	Ornamental
W. R. Clark	Pecan	Pecan
Cleveland Nurseries	Cleveland	Ornamental
Corinth Floral Company	Corinth	Ornamental
Mrs. Lelia Cordts	Canton	Ornamental
Corinth Nurseries, G. W. Strickland, Proprietor	Corinth	Peach
B. E. Cox	Perkinston	Pecan
J. L. Cox	Batesville	Strawberry
W. A. Cox Nursery Company, W. A. Cox, Proprietor	Gulfport	General
D. L. Crowell	Wiggins	Citrus
R. R. Cruthirds	Ocean Springs	Citrus and Pecan
Dan Cunningham	Big Point	General
Dantzler Farm Nursery, J. L. Scarborough, Manager	Biloxi, R. No. 2	Pecan
L. E. Davis	Gulfport	Ornamental
Murphey Deloney	Ocean Springs	Citrus
Delta Nursery, J. E. Lewis, Proprietor	Greenwood	General
O. W. Dennison	Ocean Springs	General
Driftwood Nursery, Archibald Boggs, Proprietor	Gulfport	General
Eastman Gardiner Company, Fred Weiss, Manager	Laurel	Ornamental
Eastview Nurseries, D. Cunningham, Proprietor	Big Point	Citrus
Carl Eckert	Ocean Springs	General
Edwards Nursery and Orchard Company, J. P. Edwards, Prop.	Ocean Springs	Pecan
Evergreen Nursery, Ferris & Aldridge, Proprietors	Poplarville	Ornamental
Fach Floral Nursery, Carl Fach, Jr., Proprietor	Summit	Ornamental
Mrs. S. C. Fields	Centreville	Ornamental
Ford's Pecan Nursery, Hollis & Ford, Proprietors	Magnolia	Pecan
Fountainbleau Farms, R. W. Hamil, Proprietor	Ocean Springs	Citrus
D. F. Gainey	Gulfport	Strawberry
Mrs. R. L. Glass	Long Beach	Ornamental
W. A. Glasson	Mantee	General
Mrs. E. A. Grantham	Vaiden	Ornamental
W. A. Gray	Brooksville	Strawberry

Name of Nursery—	Address—	Kind of Stock—
Greenwood Floral Company, J. W. Bealle, Proprietor	Greenwood	Ornamental
Greenview Nursery, Mrs. J. W. Summers, Proprietor	Pelahatchie	Ornamental
Gulf Coast Pecan Grove and Nursery, L. B. Moody, Prop.	Long Beach	General
W. J. Guy	McComb	Ornamental
Mrs. Will Halsell	Itta Bena	Ornamental
Miss Inez Hanna	Hattiesburg	Ornamental
Rudolph Hans	Helena	Citrus and Pecan
G. W. Harrison	Corinth	General
B. L. Hart	Fruitland Park	Citrus
Heights Floral Company, Mrs. Mildred Whitfield, Proprietor	Clinton	Ornamental
Highland Farm Nursery, F. G. Snell, Proprietor	Big Point	General
T. A. Hightower Seed Company	Hattiesburg	Ornamental
Hill Crest Farm, Port Gifford, Proprietor	Biloxi	Citrus and Pecan
Mrs. O. B. Hilzim, Florist	Yazoo City	Ornamental
T. H. Hobgood	Meridian, R. No. 4	Strawberry
W. Paul Hosier Paper Shell Pecan Co.	Pascagoula	General
Horticultural Department, P. B. Monosmith, Manager	A. & M. College	General
W. M. Huntington	Pontotoc	Strawberry
Idlehour Floral Company, L. A. Waas, Proprietor	Greenville	Ornamental
Interior Nursery Company, S. S. Smith, Proprietor	Perkinston	Pear
Jackson Grape Gardens, J. J. Clark, Proprietor	Jackson	General
Mrs. J. T. Jenkins	Dossville	Ornamental
August Jurgens	Ridgeland	Ornamental
Miss Bannie Keenum	Amory	Ornamental
Kenwood Gardens, R. E. Kennington, Proprietor	Jackson	Ornamental
L. F. Kramer	Pascagoula	Pecan
Louis Ladwig	Biloxi	Ornamental
R. E. Langley	Jackson	Ornamental
Laurel Nursery Company, Fred Weiss, Proprietor	Laurel	General
Mrs. W. J. Layton	Brookhaven	Ornamental
Mrs. Sallie A. Lewis	Starkville	Ornamental
Lilydale Nursery, Mrs. J. W. Allen, Proprietor	Long Beach	Ornamental
Lilyland Farms, W. W. Buntin, Proprietor	Starkville	General
M. A. Linch	Louisville	General
D. R. Lindsay	Ocean Springs	General
J. B. Livingston	Pontotoc	Peach Seedlings
Magnolia Floral Company, Ed Heckt, Manager	Gulfport	Ornamental
Mrs. W. E. Mauldin	Macon	Ornamental
H. C. Mayerhoff	Basic	Grape
Miss M. E. McCarter	Moss Point	Ornamental
E. V. McKay	Lucedale	General

A. McKenzie	Laurel	Pecan
W. W. McMurtray	Bentonia	Pecan
Chas. H. Morehead	Gulfport	Grape
F. T. Mullikin	Kossuth	Ornamental
J. D. Nettles	Long Beach	Ornamental
E. T. Newell and Son	Meridian, R. No. 4	Strawberry
Mrs. E. C. Newbern	Cedar Bluff	Ornamental
Newton Nurseries, J. R. Woodham, Proprietor	Newton	General
Mrs. R. P. Nickles	Steens	Ornamental
North Carolina Pecan Ranch, P. F. Barber, Proprietor	Helena	Citrus and Pecan
Oakridge Cemetery Nursery, J. H. Adams, Manager	Clarksdale	Ornamental
Ocean Springs Pecan Nursery, G. C. Pabst, Manager	Ocean Springs	Pecan
T. G. Owen and Son, Florists, T. G. Owen, Proprietor	Columbus	Ornamental
W. L. Pack	Hattiesburg	Pecan
Carrie Jones Parker	Como	Ornamental
J. Ranse Parker	Lucedale	General
W. P. Payne	Lauderdale	Strawberry
A. A. Pigford	Lumberton	General
W. E. Pigford	Russell	Strawberry
M. D. Price	Biloxi, R. No. 1	Citrus and Pecan
Poplarville Nursery, J. J. Scarborough, Proprietor	Poplarville	General
R. T. Ramsay	Ocean Springs	Pecan
W. P. Ramsay	Ocean Springs	Pecan
Ratcliff and Savage	Lauderdale	Strawberry
S. R. Ratliff	Vancleave	Pecan
Miss Anna Reed	Gulfport	Ornamental
B. Reinike	Long Beach	Pear
Mrs. M. W. Richardson	Ocean Springs	Pecan
Riviera Gardens, W. S. Marshall, Manager	Ocean Springs	General
Rudolph Floral and Nursery Company, Fred Rudolph, Proprietor	Laurel	General
The Misses Rogers	Centreville	Ornamental
Delmas Ryan Nurseries	Ocean Springs	General
S. P. Ryan	Ocean Springs	General
T. J. Ryan	Hattiesburg	General
T. M. Scanlan	Newton	Strawberry
Scott Nursery, A. C. Scott, Proprietor	Hazlehurst	General
C. O. Shackleford	Columbus	General
Rosedale Gardens, G. D. Smalley, Proprietor	Biloxi, R. No. 2	Ornamental
Francis A. Saucier	Pascagoula	Ornamental
Shannon Brothers Nursery, S. H. Shannon, Proprietor	Meridian	Pecan
Mrs. J. S. Sinclair	Meridian	Ornamental
W. M. Smith, Strawberry Grower	Landon	Strawberry
Stemme and Son	Hattiesburg	Ornamental
Mrs. J. H. Stockett	Centreville	Ornamental

Stuart Pecan Ranch, J. C. Wright, Proprietor	Ocean Springs	Pecan
Mrs. W. R. Stuart	Ocean Springs	Pecan
Mrs. O. C. Suggs	Hattiesburg	Strawberry
M. Sumedinger	Pascagoula	Citrus
Mrs. H. D. Taylor	Como	Ornamental
R. B. Thompson	Pascagoula	Pecan
Toomsuba Nurseries, W. C. Rogers and Son, Proprietors	Toomsuba	General
J. L. Travis	Batesville	Strawberry
Tupelo Floral Company, Mabry and Ballard, Proprietors	Tupelo	Ornamental
United States Nursery Company, L. M. Jenney, Manager	Roseacres	Ornamental
Van Cleave Nurseries, W. R. Vancleave, Proprietor	Pascaguola	General
F. M. Vandergrift	Ocean Springs	Pecan
J. M. Vinson	Canton	General
H. M. Ward	Canton	Kudzu
Wilson Farm Nursery, Joe P. Wilson, Proprietor	Landon	General
Mrs. Viney Woodson	Sturgis	Ornamental
Mrs. Annie Wolfe	Amory	Ornamental
Watson Nurseries, John F. Watson, Proprietor	Embry	General

THE BUFF-COLORED TOMATO WEEVIL OF AUSTRALIA IN SOUTH MISSISSIPPI

In the last number of the Quarterly Bulletin there appeared a brief discussion entitled, "A New Potato Weevil in Mississippi," that told of the discovery in South Mississippi of an interesting and possibly important pest of potatoes and tomatoes. There have been no new developments to indicate that this insect will become of any special economic importance. Mr. E. K. Bynum has, however, continued his observations and studies of this weevil.

Growers of potatoes and tomatoes in all parts of Mississippi should search frequently and thoroughly for this weevil. It is possible that its distribution may be much more extensive than we now suppose.

For the benefit of our Plant Board workers and for all others interested in potatoes and tomatoes and the discovery of this Australian pest in our country, we are publishing in full a recent letter received by Mr. J. E. Graf of the United States Bureau of Entomology, from Mr. Walter W. Froggatt, Government Entomologist of

New South Wales, and an article published by him in the *Agricultural Gazette* of New South Wales on December 2nd, 1915.

"Entomological Branch, Agricultural Museum,
George Street North, Dawes Point,
"J. E. Graf, Esq., Sydney, N. S. W., Aug. 9, 1922.
Entomologist in Charge, Field Control,
Bureau of Entomology,
Department of Agriculture,
Washington, D. C.

"Dear Mr. Graf:—Your letter of the 16th of June, enclosing a memo. from Mr. Chittenden, to hand.

"It is a very remarkable thing to find our tomato weevil, '*Desiantha nociva*' turning up in the Southern States of America.

"I am sending you my leaflet giving an account of it as a pest on tomatoes, but I might say that it is now largely cosmopolitan in its taste, and in our vegetable gardens there is so much damage to our root crops that it is particularly known in some places as the 'Carrot weevil.' The curious larva and curious habit of coming out of the soil at night to feed on plants is quite unique in the life history of weevils. It is possible that this weevil is not a native of Australia, but is an importation from some other country, and it is cer tainly much more common in the coastal districts than anywhere else, which would lead to the idea that it is an introduced and not an indigenous species. It is however widespread, very common and certainly increasing.

"Thanking you for the information which I have carefully noted, Yours faithfully,
(Signed) "Walter W. Froggatt,
"Entomologist."

"Dec. 2, 1915 Agricultural Gazette of N. S. W. 1065
Miscellaneous Publication No. 1856

The Buff-Colored Tomato Weevil
(Desiantha nociva)
Walter W. Froggatt, F. L. S., Gov. Ent.

"This destructive beetle belongs to a small group of weevils which damage plants in both the larval and adult stages of their existence. The grubs are slender, active, pale green larvæ, quite unlike the typical form of the family *Curculionidae*, and not unlike, in some cases, the caterpillars of sawflies.

"These grubs hatch out in the soil, and sheltering underground come out at night and feed upon the bark and foliage of plants, they

pupate in the earth, from whence, later on, the perfect beetles emerge, and do even more damage than the larvæ, also feeding at night and seeking shelter during the day time.

"This species was recorded from Victoria in 1908-1909, by Mr. Chas. French, junior, in the *Victorian Journal of Agriculture*, from the vicinity of Melbourne, where it did a great deal of damage to tomato plants, cabbages, and other field crops. It is figured and briefly described in Part V of French's Handbook of the Destructive Insects of Victoria, 1911. It was scientifically described and named by Mr. A. M. Lea, in the Transactions of the Royal Society of South Australia, in May, 1909.

"The buff-colored tomato weevil is under half an inch in length, thick set in proportion to its length, with the short broadly rounded thorax, and back flattened. The snout is slender, with the usual elbowed antennæ, clubbed at the tips, standing out in front of the snout; at the extremity of the snout are situated the sharp jaws, with which it does all the damage. The ground color, as is the case in many weevils, is dark blackish-brown, but so thickly clothed with fine buff and grey scales, and fine scattered hairs of the same tint, that it has a uniform earth-colored tint that enables it to elude detection when resting motionless upon the dry soil with its legs tucked under its body, a fine example of protective mimicry. When disturbed, however, it is a very active little creature, and runs off to cover at once.

"Feeding at night, and hidden away in the cracks of the ground, or just under the surface soil, these beetles may be quite numerous, and yet escape detection, unless looked for at night time when they are feeding.

"This weevil has a wide range over the eastern and southern coasts of Australia, and in this state we have several records of it damaging the young buds and shoots of fruit trees and vines in the early summer, but it was not known as a serious field crop pest until this season.

"Early in October of this year several specimens were received at the office, chiefly from the Gosford District, with the information that it was doing a great deal of damage to the tomatoes. Last month, accompanied by the district fruit inspector (Mr. Oscar Brooks), I visited the tomato plots of Mr. Young at Ourimbah, and saw the work it was doing.

"A great number of the plants had been eaten out and replaced for the second and third time by fresh seedlings; some of the older ones remaining were represented by a few inches of the main stem of what had once been a tomato plant, from which half the surface had been gnawed off in patches. Mr. Young had previously collected some hundreds of beetles, and we were able to discover about half a

dozen, generally in pairs, hiding under the plants. When the owner had written asking for assistance, previous to my visit, knowing the habits of the beetles, I suggested scooping out little depressions in the soil beside the plants, and filling it up with a handful or two of weeds, grass, or loose rubbish. This experiment he had carried out, and had found it an excellent method of trapping the beetles that sought shelter under the rubbish, instead of burying themselves under the soil. Collected together in this way, it was a very easy matter to go round every morning, examine these simple traps, and destroy the beetles. He had previously been going around the tomato plots in the night time with a lantern, and hand-picking the beetles, but as they dropped off at the least alarm it was very unsatisfactory work. Where the seedlings are well grown, after being planted out, it might be possible to place a ring of stiff oiled paper around each stem, and keep the beetles from getting on to the plants. Though provided with a pair of well-developed flying wings, hidden under the elytra or wing covers, I have never seen them attempt to fly.

"About ten species of the genus Desiantha have been described from Australia, most of which have been recorded from this state. Probably most of them are very similar in their habits, while several are well-known orchard pests.

"One species, *Desiantha maculata*, has a very wide range over Australia, from New South Wales to the islands on the coast of Western Australia. Lea states that in Western Australia it is at times very abundant, and very destructive to the buds on fruit trees, and especially bad upon the young shoots of the grape vines.

"Another species, *D. malevolens*, is also a serious pest in the Swan River district of Western Australia, and does very similar damage in the orchards.

"All these foliage-eating beetles are difficult pests to cope with, both on field crops and orchard trees, as they are much more difficult to kill with arsenical sprays than caterpillars, and would, even if the poison acted in a reasonable time, do most of the damage before they died. A contact poison has no effect upon them, as they are well protected with their hard chitinous covering. Therefore, trapping them seems to be the only practical way of destroying them."

THE QUARTERLY BULLETIN

STATE PLANT BOARD OF MISSISSIPPI

Devoted especially to the prevention, eradication, and control of insect pests and plant diseases affecting the agricultural and horticultural interests of Mississippi.

Sent free to all citizens of Mississippi on request. Offered in exchange for publications of the Federal and foreign governments and experiment stations, entomological and mycological journals, agricultural and horticultural papers, and other publications of a similar nature.

R. W. HARNED, Entomologist.....Editor
HUNTER H. KIMBALL.....Associate Editor
CLAY LYLE.....Managing Editor

Entered as second-class matter July 9, 1921, at the post office at A. & M. College, Mississippi, under the Act of June 6, 1900.

KEEP LOOKING FOR THE PINK BOLLWORM

Each fall and winter for the past five years the pink bollworm has been discovered at some new point in the United States. This most dreaded of the cotton pests has been found in three states—Texas, New Mexico and Louisiana. No one can predict with any degree of certainty where it will next be discovered. We all hope that the pink bollworm has not yet reached Mississippi and that it may never reach this state. To be on the safe side, however, every person in Mississippi who handles cotton or cotton seed should be constantly looking for this pest. If it is in the state or should be brought into the state, its prompt discovery might mean the saving of the cotton industry of the state and nation. All worms found in cotton bolls or cotton seed should be mailed promptly to the Plant Board office for determination.

GET READY FOR CORN WEEVILS

Now is the time for farmers to make preparations to prevent weevil damage to their corn this winter. All old corn should be removed from cribs, which should be swept out clean and the floors and walls made as tight as possible.

From many observations made, it is evident that weevil damage is usually greatest in corn fields near barns, consequently such corn should be stored separately and fed as soon as possible. Another important measure mentioned is sorting the weevil-infested ears from

the other corn when it is gathered. This may be done by having a barrel in the wagon to hold the infested ears, which are emptied in a separate place at the barn for immediate feeding.

Weevil damage can also be greatly reduced by selecting seed corn with long shucks extending well out beyond the tip of the ear and covering it completely. Experiments have shown that such ears will be undamaged even when exposed to the weevils for months. Fumigation with carbon bisulphide or "High Life" is very effective against weevils in tight cribs and should be used before the weevils are numerous enough to damage the corn seriously. A circular on fumigation with carbon bisulphide may be obtained by writing the State Plant Board, A. & M. College, Miss.

HAY SHIPMENTS ARE BEING WATCHED

Reports have been received that certain hay dealers are reconsigning to Mississippi shipments of hay that may have originated in states that are infested with the Alfalfa Weevil. George F. Arnold, Quarantine Inspector, therefore, recently sent the following letter to each hay dealer who has received Plant Board permits to ship hay into Mississippi:

"Dear Sir:—We have recently received information that causes us to suspect that some of the firms who hold hay permits have been making reconsignments of hay into Mississippi from the states infested with the *alfalfa weevil.* You will recall signing an affidavit that you would not ship any hay into this state that was grown in the states of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming. This affidavit states that you will be positive of the exact locality in which all hay shipped into Mississippi is grown, thereby eliminating the possibility of an error which might allow the shipment of hay from one of the above mentioned states.

"We wish to warn you that a thorough investigation will be made to determine if any firms have actually been making shipments from the prohibited areas. We will immediately cancel the permits of all firms found guilty of making such shipments and start legal proceedings under authority of the state law.

"In the enforcement of these regulations we are endeavoring to protect the alfalfa growing interests of our state against the *alfalfa weevil.* This pest has never been found in Mississippi and would cause a tremendous loss to the alfalfa growers should it ever become established here. It has been estimated that the loss from the weevil in some of the states in the Northwest totals about 50% of the alfalfa crop each year. We feel that we are justified in the enforcement of a

quarantine against the *alfalfa weevil* infested territory in view of the injury caused by the insect and in consideration of the fact that the chief danger of introducing it into this state would be in shipments of hay from the infested territory."

APIARY INSPECTION REPORT

For Period July 1—September 30.

County—	Box Hives	Frame Hives	European Foulbrood	American Foulbrood
Amite	72	35	5	---
Benton	130	---	---	---
Bolivar	139	648	35	---
Claiborne	70	231	---	---
Coahoma	54	220	51	1
Copiah	153	136	5	---
DeSoto	21	20	---	---
Hinds	220	279	5	---
Issaqueena	---	3	---	---
Lafayette	474	93	---	---
Leflore	88	114	3	---
Lincoln	30	1	---	---
Marshall	121	123	---	---
Panola	309	144	13	---
Pike	70	10	21	---
Quitman	25	272	22	3
Sharkey	86	87	3	2
Sunflower	147	350	39	3
Tallahatchie	178	206	24	---
Tate	118	37	---	---
Tunica	33	204	31	---
Walthall	21	7	---	---
Warren	89	456	3	1
Washington	36	1627	34	77
Yazoo	66	142	39	---
Total	2750	5445	333	87

It is gratifying to note in the above report that American Foulbrood is not widely spread in the State, as in the total of 8195 hives inspected during the past quarter only 10 hives with this disease were found outside of Washington County, which contained 77 infected colonies.

REPORT OF THE NURSERY INSPECTOR
For the Quarter Ending September 30, 1922

During this quarter 39 certificates were issued to agents or salesmen as required by Rule 34-B, recently adopted by the Plant Board.

Number of nurseries inspected	123
Acreage in nurseries inspected	1,241

Amount of Nursery Stock Inspected

Grafted and budded pecans	268,885
Seedling pecans	581,000
Total Pecans	849,885
Citrus trifoliata	53,435
Orange	25,936
Grapefruit	1,087
Miscellaneous citrus	2,325
Total Citrus	82,783
Apples	6,712
Pear	13,056
Japanese persimmons	1,651
Peach	27,949
Grape	16,450
Fig	7,954
Strawberry	4,726,500
Miscellaneous fruit	16,661
Total Fruit Stock (Citrus excluded)	4,899,676
Rose	185,083
Miscellaneous ornamentals	2,189,346
Total Ornamental Stock	2,374,429
Grand Total of Plants Inspected During Quarter	8,206,773

The number of acres of nursery stock inspected as well as the number of plants inspected during this quarter is considerably higher than for the inspections made during the past quarters. This increase in acreage and the number of plants is due to the fact that a number of people in North-Central Mississippi are getting into the strawberry business on a large scale. Hundreds of acres of strawberries in this section were inspected during this quarter, and this helped to bring the total up to 1,241 acres.

QUARANTINE INSPECTION REPORT

For Period from July 1, to September 30, 1922

(By Geo. F. Arnold, Quarantine Inspector)

Ships and Vessels Inspected:	
From foreign ports	11
From U. S. ports	---
Total	11
Parcels Inspected:	
Arriving by water—	
Passed	---
Treated and passed	---
Returned to shipper	---
Contraband destroyed	3
Total	3
Arriving by land, express, freight, wagon, etc.—	
Passed	32
Treated and passed	---
Returned to shipper	2
Contraband destroyed	1
Total	34
Arriving by mail—	
Passed	65
Treated and passed	1
Returned to shipper	6
Contraband destroyed	---
Total	72
Grand Total of parcels inspected	121
Number of parcels on hand September 30, 1922, pending determination as to final disposition	1
Total parcels passed	108
Total parcels treated and passed	1
Total parcels returned to shipper	8
Contraband destroyed	4
Grand Total	121

CITRUS CANKER REPORT

July 1st to September 30th, 1922

Number of counties in the state which have at one time or another since 1916 shown canker	4
Number of counties showing canker July 1-September 30	1
Number of grove trees inspected July 1-September 30	44,435
Number of nursery trees inspected July 1-September 30	29,578
Number of C. trifoliata inspected July 1-September 30	44,088
Total number of grove trees found infected June 1, 1916, to September 30, 1922	3,101
Total number of nursery trees found infected June 1, 1916, to September 30, 1922	51,167
Number of properties infected during 1917	47
Number of properties infected during 1918	14
Number of properties infected during 1919	4
Number of properties infected during 1920	0
Number of properties infected during 1921	1
Number of properties infected during 1922	2
Number of new properties infected during 1917	12
Number of new properties infected during 1918	1
Number of new properties infected during 1919	0
Number of new properties infected during 1920	0
Number of new properties infected during 1921	1
Number of new properties infected during 1922	2
Total number of properties found infected June 1, 1916, to September 30, 1922	124
Total number of properties declared no longer danger centers	122

STAFF

(In active service, September 30, 1922)

R. W. Harned, Entomologist.
Hunter H. Kimball, Chief Inspector.
J. M. Langston, Assistant Entomologist.
D. W. Grimes, Nursery Inspector.
D. C. Neal, Plant Pathologist.
George F. Arnold, Quarantine Inspector.
J. G. Hester, Assistant Entomologist.
J. L. E. Lauderdale, Assistant Entomologist, Stoneville, Miss.
T. F. McGehee, Assistant Entomologist, Holly Springs, Miss.
M. R. Smith, Assistant Entomologist.
T. F. O'Neill, Assistant Entomologist, Raymond, Miss.
*R. P. Barnhart, Citrus Canker Inspector, Ocean Springs, Miss.
*E. K. Bynum, Inspector, Gulfport, Miss.
Clay Lyle, Inspector.
George E. Riley, Assistant Inspector, Vicksburg, Miss.
*R. P. Colmer, Assistant Inspector, Pascagoula, Miss.
O. M. Chance, Assistant Inspector, Jackson, Miss.
J. E. Lee, Assistant Inspector, Meridian, Miss.
J. E. McEvilly, Assistant Inspector, McComb, Miss.
G. L. Lott, Assistant Inspector, Leland, Miss.
R. B. Deen, Assistant Inspector, Tupelo, Miss.
R. C. Price, Assistant Inspector.
C. G. Wallace, Assistant Inspector, Holly Springs, Miss.
M. H. Mabry, Assistant Inspector, Grenada, Miss.
H. H. Carpenter, Assistant Inspector, Hattiesburg, Miss.
B. L. Collins, Assistant Inspector, Corinth, Miss.
G. W. Alexander, Assistant Inspector, Natchez, Miss.
W. W. Porter, Assistant Inspector, Ocean Springs, Miss.
E. J. Anderson, Assistant Inspector, Meridian, Miss.
Miss Olive Moncrief, Preparator and Librarian.
Miss Nell Sulzby, Stenographer.
Miss Lydia Brooks Randle, Stenographer.
*Miss Lucille Davis, Stenographer.
Miss Lillian Mullins, Stenographer.

Note—Where no address is given above, headquarters are at A. & M. College.

Detailed by United States Department of Agriculture

K. L. Cockerham, Director Sweet Potato Weevil Eradication, Biloxi, Miss.
F. A. Wright, Field Agent, Sweet Potato Weevil Work, Bay St. Louis, Miss.
Troy Thompson, Field Agent, Sweet Potato Weevil Work, Van Cleave, Miss.
F. R. White, Field Agent, Sweet Potato Weevil Work, Lyman, Miss.
Kimble Harmon, Citrus Canker Inspector, Gulfport, Miss.
H. D. Money, Citrus Canker Inspector, Biloxi, Miss.
A. Lutken, Citrus Canker Inspector, Logtown, Miss.

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*In co-operation with the United States Department of Agriculture.